

The 14th Conference of The Physical Society of Hong Kong

June 11, 2011

The Hong Kong University of Science and Technology

Plenary Talks:

**Prof. Gary Shiu, University of Wisconsin-Madison
“String Theory and the Quantum Universe”**

**Prof. Kai-ming Ho, Iowa State University and
Ames Lab
“Photonic Crystals and their applications”**

Organized by: The Physical Society of Hong Kong

Co-sponsored by: Department of Physics,

The Hong Kong University of Science and

Technology

Participating Organizations:

Department of Physics, The Chinese University of Hong Kong

Department of Physics and Materials Science, City University of Hong Kong

Department of Applied Physics, The Hong Kong Polytechnic University

Department of Physics, Hong Kong Baptist University

Department of Physics, The University of Hong Kong

Department of Physics, The Hong Kong University of Science and Technology

9:00 a.m.	Registration - Outside Lecture Theatre J (LTJ)				
9:15 a.m.	Welcome Speech – Prof. H. Q. Lin (LTJ)				
9:30 a.m.	Plenary-I (LTJ) Chair: K. S. Wong Gary Shiu, University of Wisconsin-Madison				
10:30 a.m.	Poster session and coffee/tea break, outside LTJ				
11:15 a.m.	Plenary-II (LTJ), Chair: K. S. Wong Kai-ming Ho, Iowa State University and Ames Lab				
12:15 p.m.	Lunch break				
13:00 p.m.	Poster session, outside LTJ			AGM (LTJ)	
	Special Session of best student presentation competition (LTJ) Chair: R. B. Liu	AMO (2503) (Lift 25&26) Chair: T. H. Lam	CM1 (2504) (Lift 25&26) Chair:	SMB1 (4503) (Lift 25&26) Chair: Jue Shi	PP1 (4505) (Lift 25&26) Chair: K. T. Law
14:00 p.m.	C. M. Luk, Poly U	Luo Yu, HKU	Chen W.-Q., HKU (invited)	Ao Xue, HKBU	J. Hung, HKUST
14:15 p.m.	Y. T. Chow, HKUST	T. Chen, CUHK		Tsz Nam Fok, CUHK	T. Ming, CUHK
14:30 p.m.	H. Zhang, City U	J. F. Chen, HKUST (invited)	W. Wang, HKUST	Yi Peng, HKUST	Z. Marcet, HKUST
14:45 p.m.	S.-C. Leung, CUHK		Q. Zhang, City U	W.-J. Yuan, HKBU	S. Wang, HKUST
15:00 p.m.	Lee Siu To Poly U	A. Q. Jian, Poly U	C. Chan, HKUST	Y-K. Tsang, CUHK	Jensen Li, City U (invited)
15:15 p.m.	<i>break</i>	P. Zhang, HKUST	J. Dai, HKU	Zhu Yang, HKBU	
15:30 p.m.	C. Y. Leung, CUHK	Poster Session and Coffee/Tea break outside LTJ			
15:45 p.m.	K. Wang, Poly U	GP (2503) Chair: C. W. Leung	CM2 (2504) Chair:	SMB2 (4503) Chair:	PP2 (4505) Chair: Jensen Li
16:00 p.m.	K. Ninios, HKUST	Yuhan Chen, HKBU	Y. Y. Hui, Poly U (invited)	Chu Wai Siu, CUHK	Fan WANG, HKUST
16:15 p.m.	Z.-Y. Wang, CUHK	Haiyao Deng, PolyU		Wei Ling, HKBU	L. Shao, CUHK
16:30 p.m.	K.G. Hu, City U	Chan Hon Ming, CUHK	Choi Wing Hong, HKBU	Jue Shi, HKBU (invited)	Fengming Liu, HKUST
16:45 p.m.	<i>break</i>	Ka Hei Leung, HKUST	Gan Wang, HKUST		Wensheng Gao, HKUST
17:00 p.m.	Y. S. Chan, CUHK	Lei Xu, CUHK (invited)		Yi-Chao XIE, CUHK	H. M. Su, HKUST
17:15 p.m.	L. M. Kwan, Poly U			Li-Ping Xiong, HKBU	
17:30 p.m.	Wei Hong, CUHK	CAI Yue, HKBU			
17:45 p.m.	H.-T. Wong, Poly U	Ke Chen, CUHK			
18:00 p.m.	Guo Shuo, HKUST	Li Jianping, HKBU			
18:15 p.m.	Chan, Yiu Him, HKBU				
18:30 p.m.	Prize Awarding Ceremony (LTJ)				

Program

9:00 a.m. Registration - Outside Lecture Theatre J (LTJ)

9:15 a.m. Welcome Speech – Prof. H. Q. Lin (LTJ)

Plenary-I (LTJ)

Chair: K. S. Wong

9:30 a.m. Gary Shiu, University of Wisconsin-Madison

“String Theory and the Quantum Universe”

10:30 a.m.- 11:15 a.m. Poster session and coffee/tea break, outside LTJ

Plenary-II (LTJ)

Chair: K. S. Wong

11:15 a.m. Kai-ming Ho, Iowa State University and Ames Lab

“Photonic Crystals and their applications”

12:15 p.m. Lunch break

13:00 p.m. Poster session, outside LTJ

13:00 p.m. AGM, LTJ

Special Session of best student presentation competition (LTJ) *Chair: R. B. Liu*

14:00 p.m. C. M. Luk, Poly U (PG-1)
“Characterization of Al-doped ZnO films prepared by filtered cathodic vacuum arc technique”

14:15 p.m. Y. T. Chow, HKUST (PG-2)
“Study on Networks with Multi-Class Labeled Traffic”

14:30 p.m. H. Zhang, City U (PG-3)
“Transverse Spin Current in s-wave/p-wave Josephson Junction”

14:45 p.m. S.-C. Leung, CUHK (PG-4)
“Dark Matter Admixed Neutron Star (DANS)”

15:00 p.m. Lee Siu To Felix, Poly U (PG-5)
“Study of Lead-free Pyroelectric 0-3 Composites for Infrared Sensor Applications”

Break (15:15 p.m. - 15:30 p.m.)

15:30 p.m. Chung Yin Leung, CUHK (PG-6)
“A Theoretical Study of the Effect of Polymer Concentration on Turbulent Drag Reduction”

15:45 p.m. K. Wang, Poly U (PG-7)
Growth of Large Grain Polycrystalline Silicon Thin Film on Soda-lime Glass at Low Temperature for Solar Cell Applications

16:00 p.m. K. Ninios, HKUST (PG-8)
“Magnetization of a Tomonaga Luttinger liquid in a two-leg spin-1/2 ladder”

16:15 p.m. Zhen-Yu Wang, CUHK (PG-9)
“Protecting quantum systems by nested dynamical decoupling”

16:30 p.m. K.G. Hu, City U (PG-10)
“A generalized discrete singular convolution algorithm improved by regularizing singularities for one electron system”

Break (16:45 p.m. - 17:00 p.m.)

- 17:00 p.m. Yun San Chan, CUHK (PG-11)
“Coherent phenomena in binary parabolic optical waveguide array”
- 17:15 p.m. Lau Mei Kwan, Poly U (PG-12)
“Broadband near-infrared quantum cutting in Ce³⁺-Yb³⁺ codoped YAG”
- 17:30 p.m. Wei Hong, CUHK (PG-13)
“Studying the two-dimensional colloidal glass transition”
- 17:45 p.m. Hon-Tung Wong, Poly U (PG-14)
“Multifunctional GdF₃:Yb³⁺,Tm³⁺ phosphors with nearly pure near-infrared to near-infrared upconversion and paramagnetism”
- 18:00 p.m. Guo Shuo, HKUST (PG-15)
“Direct measurement of viscous drag of a fluctuating contact line”
- 18:15 p.m. Chan, Yiu Him, HKBU (PG-16)
“An Evaluation of Doping Efficiencies of Metal Oxides for Organic Charge Transporters”

*Atomic, Molecular and Optics (AMO) Chair: T. H. Lam
Room 2503(Lift 25&26)*

- 14:00 p.m. Luo Yu, HKU (AMO-1)
“Coherent state of entangled spins by collective spin pumping”
- 14:15 p.m. Ting Chen, CUHK (AMO-2)
“Non-Markovian dynamics and strong coupling between atomic transitions and a waveguide continuum edge”
- 14:30 p.m. J. F. Chen, HKUST (*invited*) (AMO-3)
“Shaping Temporal Waveforms of Narrow-Band Entangled Paired Photons”
- 15:00 p.m. A. Q. Jian, Poly U (AMO-4)
“Liquid Refractive Index Sensors Using Resonant Optical Tunneling Effect for Ultra-High Sensitivity”
- 15:15 p.m. Peiqing Zhang, HKUST (AMO-5)
“Coherent beam combining with nonlinear frequency conversion”

*Condensed Matters (CM1) Chair: TBA
Room 2504(Lift 25&26)*

- 14:00 p.m. Chen Weiqiang, HKU (*invited*) (CM-1)
“Quantum size effect in s-wave and p-wave superconductor”
- 14:30 p.m. Weihua Wang, HKUST (CM-2)
“Resolving band-structure evolution and defect-induced states of single conjugated oligomers by scanning tunneling microscopy and tight-binding calculations”
- 14:45 p.m. Qingtian Zhang, City U (CM-3)
“Spin current generation by adiabatic pumping in monolayer graphene”
- 15:00 p.m. Cheung Chan, HKUST (CM-4)
“In-gap bound states induced by time reversal impurity in HgTe quantum well”
- 15:15 p.m. Junfeng Dai, HKU (CM-5)
“Magneto-electric photocurrent generated by direct inter-band transitions in InGaAs/InAlAs two-dimensional electron gas”

Soft Matter and Biophysics (SMB1) Chair: Jue Shi
Room 4503 (Lift 25&26)

- 14:00 p.m. Ao Xue, HKBU (SMB-1)
"Study of fluctuations in gene regulation circuits with memory"
- 14:15 p.m. Tsz Nam Fok, CUHK (SMB-2)
"Relation between the statistics of the temperature fluctuations and the thermal dissipation rate in turbulent thermal convection"
- 14:30 p.m. Yi Peng, HKUST (SMB-3)
"Melting of Multilayer Colloidal Crystals"
- 14:45 p.m. Wu-Jie Yuan, HKBU (SMB-4)
"Short-term synaptic depression for explanation of microsaccades to counteract visual fading during fixation"
- 15:00 p.m. Yue-Kin Tsang, CUHK (SMB-5)
"Energy injection rate in the inverse cascade regime of two dimensional turbulence with drag"
- 15:15 p.m. Zhu Yang, HKBU (SMB-6)
"Identification of genome-scale regulatory targets in cellular metabolism by block triangular decomposition"

Plasmonic and Photonic (PP1) Chair: K. T. Law
Room 4505(Lift 25&26)

- 14:00 p.m. Jenny Hung, HKUST (PP-1)
"Optical activities of micro-spiral photonic crystals fabricated by multi-beam holographic lithography"
- 14:15 p.m. T. Ming, CUHK (PP-2)
"Understanding Plasmon-Fluorophore Interactions"
- 14:30 p.m. Z. Marcet, HKUST (PP-3)
"Controlling the polarization of light transmitted through metallic bilayers of subwavelength apertures"
- 14:45 p.m. Shubo Wang, HKUST (PP-4)
"Resonance Enhanced Electromagnetic Forces"
- 15:00 p.m. Jensen Li, City U (*invited*) (PP-5)
"Transforming field at the optical domain"

15:30 p.m. -16:00 p.m. **Poster Session and Coffee/Tea break outside LTJ**

General Physics (GP) Chair: C. W. LEUNG
Room 2503(Lift 25&26)

- 16:00 p.m. Yuhan Chen, HKBU (GP-1)
"The formation of complex cortical networks under multiple constraints"
- 16:15 p.m. Haiyao Deng, PolyU (GP-2)
"Hidden rotational symmetry within a generalized ising model"
- 16:30 p.m. Chan Hon Ming, CUHK (GP-3)
"The Study of Cosmic Ray and its Relation with Atmosphere"

- 16:45 p.m. **Ka Hei Leung, HKUST** (GP-4)
 “A Model Spin System with Three Spin Interaction and Ground States with Fractal Structure”
- 17:00 p.m. **Lei Xu, CUHK (invited)** (GP-5)
 “The Secret of Splashing”
- 17:30 p.m. **CAI Yue, HKBU** (GP-6)
 “Photoacoustic monitoring of mass removal in pulsed laser ablation”
- 17:45 p.m. **Ke Chen, CUHK.** (GP-7)
 “A theory on the global optimization of dynamical decoupling schemes,”
- 18:00 p.m. **Li Jianping, HKBU** (GP-8)
 “A Versatile High-resolution UV-Vis-NIR Fourier Transform Hyperspectral Imaging System”

Condensed Matters (CM2) Chair: TBA
Room 4503(Lift 25&26)

- 16:00 p.m. **Y. Y. Hui, Poly U (invited)** (CM-6)
 “Ultra violet cathodoluminescence from ferromagnetic Mg-doped AlN zigzag nanowires”
- 16:30 p.m. **Choi Wing Hong, HKBU** (CM-7)
 “Highly efficient single host white organic light-emitting diodes”
- 16:45 p.m. **Gan Wang, HKUST** (CM-8)
 “Formation Mechanism of Ni₃Se₄/ZnSe Heterostructured Nanowires”

Soft Matter and Biophysics (SMB2) Chair: TBA
Room 4503(Lift 25&26)

- 16:00 p.m. **Chu Wai Siu, CUHK** (SMB-7)
 “Effect of Polymer Additives on Heat Transport in a Boundary Layer Flow”
- 16:15 p.m. **Wei Ling, HKBU** (SMB-8)
 “How Hog1 Protein Abundance Affects *S. cerevisiae*’s Growth upon Osmotic Shock?”
- 16:30 p.m. **Jue Shi, HKBU (invited)** (SMB-9)
 “Coping with DNA damage by differential regulation of p53 pathway dynamics”
- 17:00 p.m. **Yi-Chao XIE, CUHK** (SMB-10)
 “Experimental study of the large scale circulation in two-layer turbulent Rayleigh-Bénard convection”
- 17:15 p.m. **Li-Ping Xiong, HKBU** (SMB-11)
 “Noise propagation in biochemical networks”

Plasmonic and Photonic (PP2) Chair: Jensen Li
Room 4505(Lift 25&26)

- 16:00 p.m. **Fan WANG, HKUST** (PP-6)
 “Comparison between a single zero refractive index slab and complementary slabs”
- 16:15 p.m. **L. Shao, CUHK** (PP-7)
 “Study on The Plasmon Coupling between Two Au Nanorods”
- 16:30 p.m. **Fengming Liu, HKUST** (PP-8)
 “Dirac cones induced by accidental degeneracy in phononic crystals and zero refractive index materials”
- 16:45 p.m. **Wensheng Gao, HKUST** (PP-9)

“Optical activities in complementary double layers of six-armed metallic gammadion structures

17:00 p.m. H. M. Su, HKUST

(PP-10)

“Pulse Propagation Delays in Light Transmission Through Periodic Metallic Aperture Arrays”

18:30 p.m. Prize Awarding Ceremony (LTJ)

Posters

1. **An Innovative Method for Measuring Small Magnetic Field**, K. L. LI, CU.
2. **Plasmon Coupling of Gold Nanostructures**, H. J. Chen, L. Shao, K. C. Woo, J. F. Wang, Hai-Qing Lin, CU.
3. **Scaling of Quantum Zeno Dynamics in Many-body systems**, Wing Chi Yu, Li-Gang Wang, Shi-Jian Gu, and Hai-Qing Lin, CU.
4. **A shell-model study of polymer effects on homogeneous turbulent thermal convection**, S. Y. Huang, E. S. C. Ching, CU.
5. **Palladium coated tungsten oxide for hydrogen sensing**, M. Zhao and C. W. Ong, POLY-U
6. **Field effect of 2DEG at LaAlO₃/SrTiO₃ interface and its application as ionic molecule sensor**, Au Ki and J.Y. Dai, POLY-U
7. **Large-area anodized alumina nanopore arrays by soft ultraviolet nanoimprint prepatterning**, S. M. Ng, H. F. Wong, H. K. Lau, C. W. Leung, POLY-U
8. **ZnO nanorod fabricated on Ni-coated polyester fiber**, C. P. Wong, C. L. Mak, POLY-U
9. **Application of electrospun TiO₂ nanofibers with effective surface modification in organic-inorganic hybrid solar cells**, Shing Chung Lo, Zhike Liu, Helen L. W. Chan, Feng Yan, POLY-U
10. **Using Reactive Ion Etch to fabricate a-Si/Crystalline silicon nanorods**, Zihan XU and K.H. Wong, POLY-U
11. **Enhanced mid-IR emission from rare-earth ions doped tellurite glass**, Lili Tao, Yuen H. Tsang, Bo Zhou, Billy Richards, Animesh Jha, POLY-U & CITY-U
12. **Surface nitrogenation induced thermal conductivity attenuation in silicon nanowires : a molecular dynamics study**, H. P. Li, Abir De Sarkar and R. Q. Zhang, CITY-U
13. **COMPUTATIONAL STUDIES ON RAMAN SPECTRA IN HYDROGENATED SILICON QUANTUM DOTS**, Q. Wu and R. Q. Zhang, CITY-U
14. **Thickness optimization of OLED encapsulation**, Jimmy To, , Wong Fu Lung, C. S. Lee, Juan Antonio Zapien, CITY-U
15. **Synthesis and optical properties of Cl-doped ZnS nanoribbons**, Yankuan Liu, Linbao Luo, Xing Xie, Yucheng Dong, Chunyan Luan and Juan Antonio Zapien, CITY-U
16. **Effect of catalyst selection on the morphology and properties of CdSSe nanoribbons growth by VLS method**, Chunyan Luan, Juan Antonio Zapien*, Yankuan Liu, Yucheng Dong, Hong-En Wang, Igor Bello, Shui-Tong Lee, CITY-U

17. **Growth of Bi₂Se₃/ZnSe multilayers**, X. Guo, H.D.Li, Z. Y. Wong, T. L. Wong, N.Wang, M. H. Xie, HKU & UST.
18. **Membrane-type Acoustic Metamaterial with Negative Effective Modulus**, Guancong Ma, Min Yang, Zhiyu Yang, UST.
19. **Homogenization of Acoustic Metamaterial in one-dimension**, Min Yang, Zhiyu Yang, UST.
20. **Optimization through Nearest Neighbor Interactions: Applications to Sensor Networks**, S. L. Chow and K. Y. Michael Wong, UST.
21. **Possible nodal structure in the order parameter of the Fe-As pnictide superconductor Ba(Fe_{1-x}Cox)₂As₂**, Ye Piao and Rolf Lortz, UST.
22. **Factors affecting the shape of MBE-grown laterally aligned Fe nanowires**, J. Tian, S.K. Lok, G.K.L. Wong and I.K. Sou, UST.
23. **Network Trading Model on Scale Free Networks**, H.F. Cheung, B. Li, Y.H. Lam, and K.Y. Michael Wong, UST.
24. **HRTEM Studies of ZnSe nanotrenches**, G.. Wang, S.K. Lok and I.K. Sou, UST.
25. **Phase-space networks of frustrated spin models and lattice gas models**, Feng WANG, Yilong Han, UST.
26. **Polarized Angular Distributions in the Decays of the ¹D₂ State of Charmonium Produced in Proton-Antiproton Annihilation**, M. F. Chow and A. W. K. Mok, HKBU.
27. **Measuring Binding Kinetics of Ligands with Tethered Receptors by Fluorescence Polarization Complemented with Total Internal Reflection Fluorescence Microscopy**, KWOK Ka Cheung and CHEUNG Nai Ho, HKBU.
28. **Biophysical effects of alternating electric field on cellular dynamics of cultured mammalian cells**, Kong Ho Ming and Shi Jue, HKBU.
29. **Modeling tumor growth with bacterial cancer therapy**, Xue-fei Li¹, Jian-dong Huang², Terence Hwa³, and Lei-han Tang¹ HKBU.
30. **Organic photodetector with inverted structure**, K.C. Tam¹, K.W. Cheah¹ HKBU.
31. **Plasmon enhanced performance of organic photovoltaic devices using Ag nanoparticles**, Yang Qingyi and Zhu Furong HKBU.
32. **Biophysical effects of alternating electric field on cellular dynamics of cultured mammalian cells**, Kong Ho Ming AND Shi Jue, HKBU